THE LABORATORY METHOD IN THEORY AND PRACTICE

A description of the laboratory method in beginning German was given in an article which appeared in the May number, 1911, of *Die Neueren Sprachen*. But for the purpose of clear and immediate connection of the points in this paper with the different phases of the method I shall give a brief preliminary explanation of it.

My first experiment with the method was made in the fall semester of 1903. For ten years I had taught German by the grammar method. But with each succeeding year I felt more and more dissatisfied with the results. With all my efforts in drilling and assuring my students that they were studying a living language in which their own thoughts could be expressed they seemed unable to free themselves from the notion that the language was all in the book. As I studied the problem and analyzed the short comings of the method it seemed to me that the principal factor in a solution of my problem would be a bookless method by which a carefully selected and classified vocabulary and the essentials of grammar would be developed according to correct principles of mind and language instruction. I was somewhat familiar with *Anschaungs-unterricht;* I had studied the natural method under Dr. Sauveur, whose certificate I had been proud to receive; I had read Gouin; I had taken my college German under an excellent teacher of the grammar method and therefore felt I could venture out on a new path without great danger of getting lost. My experience in the scientific laboratory had suggested to me the practicability of applying the principles and methods employed there to the study of beginning language. For my purpose the salient feature in these consisted in giving to the student the theory and materials of the science and letting him work out his own result. Accordingly, I extended my recitation period to two hours and called the method the laboratory method.

I begin the work of the course by explaining to my students the historical relationship between the English and the German. I study with them the political and topographical map of Germany, talk to them about the government, life and customs of the German people and hint at the richness of their literature. I then take up the sounds of the new language and by the application of simple

phonetics, using Viëtor's Lauttafel, I classify and illustrate them in alphabetical order and give the students practice in writing and pronouncing phonetic script. A brief description of the parts of speech and their variations completes the introductory work which covers about two weeks of time.

The first part of the next period is given to the presentation of materials for the students to work with. These materials consist of vocabulary, inflected forms, and rules of grammar and syntax. The students are provided with special blank books of ruled paper, 8½ inches by 14 inches in size. The leaves are cut in two halves so that there are upper and lower leaves which may be turned back and forth independently of each other. On the even pages of the upper leaves are written the nouns, each gender in a separate column, adjectives, prepositions and adverbs; on the opposite or odd pages of the upper leaves the verbs and paradigms. Each class of words has its particular position on the page.

In developing a vocabulary I first pronounce distinctly the German word and have the class repeat it in concert after me, sometimes more than once. If it is a noun I always pronounce the definite article with it and in the response the students do the same. I then write the word on the board and the students copy it in the appropriate place in the note books, if a noun the definite article and signs of the genitive singular and nominative plural with it. I then hold up the illustrative chart and pointing to the object ask the class to name it. These charts are made of heavy cardboard 14 inches by 22 inches in size on which are mounted pictures selected with special reference to the idea which they are to convey and gathered from illustrated magazines and penny picture collections. In this way I develop a vocabulary of from twenty-five to fifty words. I then give the class an installment of inflections, writing the forms on the board which are copied into their note books. Along with and following the development of the materials, oral work is carried on in which the class as individuals or in concert takes part. The rest of the class period is employed by the students in writing original sentences based on the materials which have been presented to them. For this composition, which constitutes their laboratory work, they use the even pages of the lower leaves immediately under the corresponding vocabulary, and while they are thus at work I pass round among them and

correct with red ink the mistakes they make. While writing sentences on any given vocabulary any previous vocabulary may easily be brought to view by simply turning over the upper leaves without turning the page on which the student is writing. Occasionally, I have the class stop before the end of the period and read to each other the sentences they have composed.

The work outside of class, aside from learning forms, is of two kinds. For the first day after I have developed a new vocabulary I have the students compose additional original sentences. At the next recitation after a review of the vocabulary by use of the chart, some of these sentences, the number depending on the size of the class, are written on the board and corrected by the class, each student reading and, if necessary, translating sentences written by others. For the next day I dictate English sentences to be translated into German. These, after a second review of the vocabulary by means of the chart, are corrected in class and then written on the odd pages of the lower leaves. These dictations give me an opportunity of bringing out word relations and of illustrating principles and rules of grammar and syntax which may have been missed by the students in their original sentences. In reviewing a vocabulary I hold up the chart before the class, point to the objects and ask the class one after another, or sometimes in concert, to name them or answer questions about them, always requiring them to give the plural of nouns and the principal parts of the verbs. In this way an average vocabulary may be thoroughly reviewed in from five to ten minutes.

Passing now to the psychological and pedagogical theories and principles upon which the method is based I shall assume that modern language teachers are generally agreed that successful and therefore enjoyable progress in the learning of a new language depends upon the acquisition of a vocabulary, and coincident with that a feeling for the new language. Psychologists and language teachers have by scientific research and experience shown the great importance of a *Sprachgefühl* and are agreed upon the means by which it is developed. The learning of a new language is but the formation of new habits and the method that will work best in teaching a new language is the one that will apply most fully and consistently the psychology of habit. In speaking of a vocabulary language teachers generally distinguish between an active and a

passive vocabulary and this distinction and the relation of one to the other ought to be kept clearly in mind in the discussion of language methodology. The prevailing view now, as I understand it, is that the aim of the work in beginning language should be the acquisition of an active vocabulary in which the essentials of grammar are dissolved. If this active vocabulary in a given language were standardized, then the method which would most quickly and at the same time thoroughly accomplish the aim we have in mind could well lay claim to excellence. Scattered sentiments in favor of a standardized active vocabulary in German have been expressed, but so far they have not crystallized into concerted action. German teachers would probably not agree as to the number or choice of words to be included in such a vocabulary but I for one would welcome a serious effort to determine what could and ought to be accomplished in the acquisition of an active vocabulary in a given length of time.

If these then are the aims and problems of beginning language teaching let us see first what light psychology throws upon them; what answer it gives to the question as to the best way of dealing with them. Wundt in his work on *Die Sprache*, vol. 1, pp. 558 ff. discusses the psychology of word concepts (Wortworstellungen) and states the laws that govern them. The word, he says, is a very complex psychic product (Gebilde) which makes a great variety of associations possible and through the different connections of its parts preserves it from destruction. The composite word is made up of three principal constituents, sound, sight and sense or idea. Each of these again has a two-fold aspect; the element of sound consisting of the acoustic image (a) and the articulatory sense or impulse (m); the element of sight consisting of the optical image (o) and the muscular or pantomimic sense or impulse (m′); the element of idea consisting of the intellectual concept (v) and the emotional content (g). Putting this statement in the form of a diagram and using the German terms it would appear thus:

Das Wort
- Lautbestandteil
  - Lautvorstellung (a)
  - Artikulationsempfindung (m)
- Zeichenbestandteil
  - Zeichenvorstellung (o)
  - Bewegungsempfindung (m′)
- Begriffsbestandteil
  - Begriffsvorstellung (v)
  - Gefühlston (g)

a
m
o
m'
r
g

The manner in which these various elements are associated with each other and the strength or prominence of the different associations are shown by the following figure which I have drawn. This is quite different from the one given in the book and for my purpose has several advantages which Wundt himself, to whom I submitted it, did me the honor to mention. Professor Wundt in his figure connects the various elements by horizontal brackets, the strength and direction of the various associations being shown by parallel or identical lines. Bruno Eggert in his pamhlet: "Der psychologische Zusammenhang in der Didaktik des neusprachlichen Reformunterrichts" gives the figure in the form of a hexagon, but it also fails to bring out certain important facts.

A study of the figure reveals the following facts: 1. That the strongest associations are am, ma, ag, ga and m′m. 2. Next to these in strength are av, ov, and om. 3. That there is no direct association between o and g. Before interpreting these facts and their bearing upon the method under discussion an explanation of the different associations ought perhaps to be made. As will be noted by the arrows all the associations indicated in the upper half of the figure run in one direction and those in the lower half in the other. Taking the upper half first:

am = the mechanical oral repetition of words we hear.
am′ = the mechanical transcription of words we hear.
av = the understanding of the objective meaning of words we hear.
ag = the reception of their emotional content.
mm′ = the mechanical copying of our own spoken words.
om′ = the mechanical copying of words we see.
ov = the understanding of words we read.
The meanings of the associations in the lower half are:
ma = the recollection of the acoustic image of the spoken word.
oa = the recollection of the acoustic image of printed symbols.
va = the thinking in sound images.
ga = the feeling in sound images.
om = reading aloud.
m′m = the articulation of words we are writing.
m′o = the recollection of optical image of words we have written.
vo = the thinking in optical images.

The associations indicated in the upper half of the figure are those that enter into the acquisition of a passive vocabulary while those in the lower half are involved in the mastery of an active vocabulary so that one's ability to speak a foreign language would ordinarily be represented by the combination vgam, the ability to write it by vgamm′, and the ability to read it intelligently by omagv.

Coming back now to the interpretation of the facts shown by the figure we note that the most numerous associations are connected with the ear, that the feeling for the language can be acquired through the ear alone, that the strongest associations are those between the auditory impressions and the articulation of the vocal organs (am), and between the writing of the words and their vocal articulation (m′m,) and next to these the association between the writing of words that are heard and seen and their vocal articulation (am′, om′).

Recalling now the manner in which a vocabulary is developed by the laboratory method it will be observed that it carries out fully the psychological principles just discussed. Every association entering into the acquisition of a word is established. The first and strongest impression of a new word is received through the ear, the natural language organ, upon which the students immediately react by pronouncing the word (am). They next see the written word which they copy into their note books thus calling to their aid their eyes and the muscular movements of their arms (om′), and finally by means of the chart and another utterance of the word the climax of the process has been reached (av, ag).

With this brief statement of the claim of the method to a correct psychological basis I shall pass on to the consideration of some of the pedagogical principles which are brought to bear upon it and the first of these that I shall mention is interest. Visitors in my class invariably comment upon the eager interest and participation of the students in the work that is being done, especially in the acquisition of a new vocabulary. From the time each new word is uttered until its meaning is revealed on the chart or in a sentence, suspense and curiosity as to what it stands for are written on every face. One explanation for this interest is found in the diversified activity of the class period and the variety of mental stimuli attending the work. Although the recitation period is two hours

long and comes at the most unfavorable time of the day, 1:30 to 3:30, there are few complaints as to its length or tediousness. Another explanation for the interest is that the method appeals to the creative instincts of the students. It is perfectly natural that a student should take more pride and satisfaction in planning and building his own structure than in working in monotonous union with others on a piece of work that has been prescribed. When my students begin to write their original sentences a pleasant sense of freedom seems to prevail, but along with this freedom there is felt a responsibility which makes for accuracy and growth. This work also engenders a spirit of emulation among the students. They take pride in writing interesting sentences and without mistakes. In correcting the original sentences on the board I always state the number of mistakes occurring in a sentence and let the students point them out. When a student knows that the eyes of all the class are to scrutinize his sentences, the product of his own mind, the greatest possible spur to serious effort is applied. With these strong incentives to interest in operation there is provided another pedagogical requirement, namely attention. The work carried on with the class is so direct, concrete and varied, the curiosity and participation of the students so constant that there is little opportunity or temptation for thoughts to wander. In language study frequent and rapid repetition of a vocabulary is an essential pedagogical requirement. By means of the charts and the oral exercises based upon them a given vocabulary may, whenever desired, be reviewed in a minimum amount of time.

If the progress of a student in a foreign language is measured by the number of words which he knows and can use, this method may rightfully claim to be successful on three grounds. To begin with, the first impression made by every new word which is learned is so vivid that it is likely to remain. Secondly, these impressions are so easily and quickly reviewed by means of the charts that what may have been lost in vividness is gained by repetition. As a rule two reviews of any one chart are sufficient to enable the class to recite promptly and accurately the vocabulary represented by it. As stated before, the definite article is always learned with the noun and very often when I point to an object a student will say: "that is *die*, or *der*, or *das*, something," and when a chart has been learned a student rarely makes a mistake in gender. The third

ground is the greatly enlarged acquaintance with the vocabulary as a vehicle of thought. For example, I have a class of twenty and on a given vocabulary each one writes five original sentences. This makes one hundred sentences, no two of which probably are alike. Each student has thus presented to him ninety-five more ideas than he has expressed by the same vocabulary. It may happen that the same word is used in twenty different relationships and in this way its potency is increased twenty times. Another aid to remembering the words that should be mentioned is the classification and graphical disposition of the vocabularies in the note books. Many of my students testify that they remember the gender of a noun largely by the position of the column in which it appears on the page. The same is true of the grammatical forms which are always developed in advance with the class and by each student written in his own note book so that he knows just where to look for them. By means of the twenty charts which I have so far been using I develop a practical vocabulary of over a thousand words which the class can use with comparative readiness. I accomplish this work by the Christmas holidays and cover all the topics of grammar. This is, of course, made possible by the double length period of recitation, to which, in my opinion, beginning language study is preeminently entitled. I believe it can be shown that the rate of progress in learning a language is in geometrical proportion to the length of the daily contact and drill in it. That educators have come to see the value of such prolonged contact with and guidance in the study of high school subjects is shown by the rapidly spreading movement for supervised study. Under such a plan the method under discussion strongly commends itself because the laboratory composition would be made the work of the study period. The last pedagogical advantage of this method that I shall speak of is the opportunity it affords for individuality and originality. The original sentences which a student composes give an interesting insight into his character and personality. There is the student of poetic temperament who always avoids the commonplace and sometimes writes in rime. The practical, orderly student will stick to facts and have but little variety in his sentences. I have had students who always saw the comical side of things and the wit and humor of their sentences were always sure to provoke laughter. It is a source of constant delight to

study these different types of character and to watch the operations of their minds, and this close contact with the student and the intimate knowledge of his temperament give the teacher a much more satisfactory basis on which to judge his ability and his merit than can possibly be obtained by the old method.

Let us pass now to the consideration of the laboratory method in practice. I shall first of all anticipate the most probable comment to be made upon it and admit that it makes hard work for the teacher. It requires physical endurance, nervous energy and more or less ingenuity to keep things going for two hours and to create and maintain a language atmosphere. The development of a vocabulary requires preparation and animation and another great strain comes when the students are at work forming their original sentences, for one never knows out of what difficulty a student must be helped and one must be prepared for any emergency. It is no prescribed text-book lesson and exercise which the teacher can study and learn in advance from day to day. But if the method requires extra strength on the part of the teacher, it also yields a tonic in the increased interest and progress of the class which more than compensates for it. I have a conviction that the interest and progress of a class and the ease of the teacher are in inverse proportion.

The question might be asked whether the same amount of time and energy spent on the other method would not produce the same results. My answer would be no, because the interest of the class could not be secured. Reciting paradigms and corrected exercises that have been memorized is not calculated to arouse the enthusiasm of the average student. But please his eye, arouse his imagination and give him material with which to work out his creative impulse and you can hold his interest indefinitely.

The second comment on the method would probably be that it requires better prepared teachers than are to be found in the average high school. The same may be said of any successful method of teaching language or science, but the answer to this and all similar objections must always be that progress in education, art, government or industry can not wait for those who are not trained to carry it on. By raising our standards for language teachers we shall gradually attract into our ranks more capable and better equipped members and thereby add dignity, honor and

accomplishment to our profession. Those of us who are preparing language teachers for the high schools must see to it that the product we turn out shall show steady improvement.

A third difficulty in the way of a general adoption of the method is the double length recitation period which its most successful use requires. Objection to the double period is to be expected from students, teachers and administrators. From students because of prejudice or misunderstanding as to the principles and processes of successful language study; from teachers because of their unwillingness to pay the price of extra time and energy and from administrators because of the increased demand upon recitation rooms and hours. These same groups, however, accept the demands of the sciences for double class periods as a matter of course, and any attempt to restrict them would be considered heresy. My contention is, and psychology and pedagogy will bear me out in it, that the double length period is more necessary for successful initial language study than for science. If language teachers should agree upon the statement just made as true, then we ought without apology to claim the right and privilege to put its principle into effect. If a movement for double length language recitations were to be undertaken I believe the laboratory method would commend itself for adoption. The very name of it would make it easier to get concessions for it. The idea of a language laboratory, conducted according to scientific principles, would appeal to many and reconcile much opposition to the double period. When once introduced and results shown it will be able to stand upon its merits.

The last practical phase of the method that I shall mention is a possible plan for handling large classes. The maximum number of students which one instructor can oversee during the laboratory period is about fifteen. The most effective work can be done with about ten. In the development of a vocabulary and the presentation of materials, however, a class of fifty or more could probably be handled. Now according to the plan I have in mind the head teacher would conduct the developing work with the whole class which would then be broken up into small groups for the laboratory work, and each group put under the supervision of competent assistants, in universities possibly teaching fellows or foreign exchange teachers. I have never had opportunity to try this plan, because for reasons already given my classes have always been

small, but if circumstances made it necessary I feel sure it would work. An alternative plan would be for the teacher to meet the small groups for laboratory work at different hours but the break in period and continuity of work would cause some loss.

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